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Eastern Region
Leetown Science Center
Fish Health Branch

Mycobacteriosis in Striped Bass

Mycobacteriosis is an emerging threat to the Chesapeake Bay striped bass and the fisheries it supports.

Striped bass harvested from the Nanticoke River , Maryland
(Photo by Mark Matche, Maryland Department of Natural Resources)

Mycobacteriosis is a bacterial disease in which striped bass (rockfish) may be disfigured as a result of skin ulcers and internal lesions. The bass may also be skinny or in extremely poor condition due to the chronic nature of this wasting disease. Stripers are a highly prized target species for both recreational anglers and commercial fishermen. As such, the economic impact of diseased and devalued fish could be significant. In addition, some of the mycobacteria that commonly infect fishes can cause infections in people and therefore are a human health concern. The total extent to which the disease is occurring along the Eastern seaboard is unknown but the disease has been reported from stripers taken from North Carolina to New York. During 1998-99, skin ulcers attributed to mycobacterial infection were observed in up to 28% of the striped bass from some Virginia tributaries of the Chesapeake Bay. Data obtained during 2002—2003 from fish harvested in Virginia and Maryland waters indicated that, at least in some areas, over 80% of striped bass may be infected with the mycobacteria that are associated with the disease. Given the persistence over the last 8 years of this mycobacteriosis outbreak, this does not appear to be a short-term problem.

Mycobacteria colony
(Photo by M. Rhodes and H. Kator, Virginia Institute of Marine Science)

Dietary deficiencies resulting from depleted stocks of prey species and stress associated with high summer temperatures and/or reduced dissolved oxygen have both been suggested as contributing factors to the current epizootic. Laboratory studies suggest that as least some of the mycobacteria isolated from Chesapeake Bay striped bass are highly virulent at temperatures where the fish would be stressed and potentially

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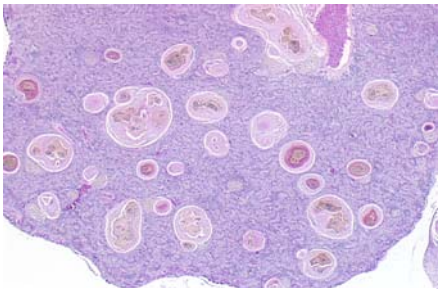
Fact Sheet FHB 2002-01
Updated June 2005

Current Research

- Partners and Co-operators: Maryland Department of Natural Resources, Virginia Institute of Marine Science, University of Maryland, U.S. Fish and Wildlife Service, Centers for Disease Control and Prevention, Atlanta, Stony Brook University
- Activities:
  - Characterizing mycobacteria obtained from diseased Chesapeake Bay striped bass and standardizing field and laboratory methods.
  - Developing non-lethal sampling methods for determining mycobacterial infection status in striped bass.
  - Examining infection and disease status in striped bass from Chesapeake and Delaware Bays.



Striped bass spleen tissue with typical mycobacteria-associated pathology
(Photo by D. Gauthier, Virginia Institute of Marine Science)

immunosuppresed If these factors are contributing to the mycobacteriosis outbreak currently observed in Chesapeake Bay, the epizootic may indicate that the conditions required for supporting this species at current population levels do not exist or that these conditions are deteriorating.

Research needs to move forward in two areas. Relatively little is known about the incidence of mycobacteriosis within migratory striped bass populations occurring in the eastern coastal region. The lack of information on age specific mortality associated with the disease and the effects on reproductive biology and spawning success make estimates of population impacts currently impossible.

Field studies are required in multiple east coast watersheds to help put the Chesapeake Bay outbreak into context and to better identify affected striped bass stocks. Additional fieldwork needs to be conducted in conjunction with existing Chesapeake Bay striped bass tagging-programs to provide estimates of population-level impacts. Once the *Mycobacterium* isolates obtained from diseased striped bass have been characterized and their ability to produce the observed diseased confirmed, the mechanisms involved in disease development and transmission can be determined. By understanding the dynamics

Striped Bass with internal mycobacteria-associated lesions.
(Photo by D. Gauthier, Virginia Institute of Marine Science)

of mycobacteriosis within striped bass populations and characterizing the disease mechanisms we should be able to identify points within the disease-development process where fisheries management tools (e.g. regulations on harvest times, gear use, etc.) can be used to reduce the spread of the disease in striped bass stocks and to minimize risks to fisherman.